

REMARKS

Status

Claims 9-19 were pending in this Office Action. By the present amendment, claims 9-19 have been canceled, and new claims 20-23 have been added. Accordingly, it is now claims 20-23 which are at issue.

The Present Invention

The invention, as now claimed, is directed to an adhesive tape having a light emitting, readily visually detectable edge. The tape of the present invention addresses a significant problem encountered in the use of flexible, relatively transparent adhesive tapes. As is described in detail in the present application, owing to their thinness, flexibility and transparency, tapes of the type contemplated by the present invention are widely used for packaging and repairing various items. The thinness and transparency which make such tapes suited for these purposes also creates a problem insofar as it is very difficult for a user to find a free edge of the tape when the tape is wound into a roll, as is conventionally done. This results in torn and wasted tape. The present invention addresses this problem by providing an adhesive tape which is thin, flexible, and relatively transparent, but which has an edge which emits light, thereby rendering the edge easier to find.

The new claims are all restricted to one particular embodiment of the present invention which relies upon the phenomena of fluorescence and internal reflection to illuminate the edge portion of an adhesive tape. As is specifically recited in independent claim 20, the tape of the present invention includes a fluorescent material, such as a fluorescein dye, disposed in the bulk thereof. This dye absorbs light of a first wavelength, and emits light of a second wavelength which is different from the first wavelength. Since the dye is disposed within the bulk of the tape, and since the fluorescent emission of the dye takes place in all directions despite the

direction of the exciting illumination, a large portion of the emitted dye will be confined into the bulk of the tape by internal reflection. The phenomenon of internal reflection is exploited in fiber optics, for example, to restrict light to a path of travel within the body of a relatively high refractive index material. This same phenomenon confines a large portion of the light to the bulk of the tape causing it to exit the edge portions of the tape. This concentrates the light at the edge portions. In addition, the fluorescent emissions take place in a relatively narrow bandwidth, despite broadband white light excitation. As a consequence, the tape of the present invention will present a glowing, distinctly colored edge which facilitates detection. Since the concentration of fluorescent material need not be very high, the white light density of the tape when viewed between the first and second surfaces thereof will be relatively transparent. In preferred embodiments of the present invention, the white light optical density of the tape will be at least 90% of the white light density of a comparable tape not including the fluorescent material.

The New Claims

In order to expedite prosecution of this application, Applicant has cancelled pending claims 9-19, without prejudice, and substituted therefor new claims 20-23. The new claims are all specifically directed to the embodiment of the invention in which the aforescribed phenomena of fluorescence and internal reflection are exploited to create a detectable edge in an adhesive tape. Applicant reserves the right to file one or more continuation applications directed to the other disclosed embodiments of the present invention.

The new claims are all allowable over the prior art of record. None of the prior art references shows any type of device, much less an adhesive tape, which utilizes the phenomena of fluorescence and internal reflection to provide a body of material having a light emitting,

detectable edge. Previously pending claims 9-19 were subject to a rejection under 35 U.S.C. §103 in view of U.S. Patent 5,474,194.

The '194 patent discloses a bottle closure having an irreversible color change system incorporated therein to detect and indicate tampering and the like. The system of the '194 patent includes a display layer having indicia formed thereupon. The indicia are covered by a brittle masking layer. When the closure is disrupted, as for example by opening or tampering, the brittle layer breaks away allowing the indicia on the display layer to become visible. Display of the indicia is accomplished by removal of a masking layer. Internal reflection is not required, nor is it possible in the disclosed arrangement. The system of the '194 patent is described as utilizing a fluorescent ink to produce the indicia; however, use of this particular type of ink is not essential to the '194 patent. In any case, the fluorescent material in the '194 patent is disposed atop the display layer and is not shown or suggested as being within the bulk of the layer.

In contrast, claims of the present invention are all directed to a system in which (1) a fluorescent material is disposed within the bulk of a flexible body of tape backing material and (2) internal reflection channels light generated by the fluorescent material through the body of material causing it to exit, in concentrated form, from the edges of the material rendering them highly visible.

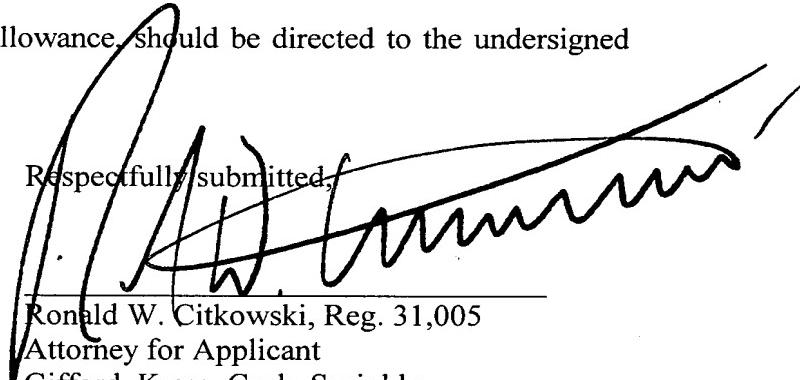
The '194 patent does not show or suggest any of the principles of the present invention. First of all, the '194 patent is directed to tamper-indicating bottle closures and not adhesive tapes. Secondly, the '194 patent does not show any device in which a fluorescent material is disposed within a bulk of a body, nor does it show any device in which light generated by a fluorescent material is channeled through the bulk of a body so as to exit from the edges thereof. Finally, the invention of the '194 patent does not even begin to acknowledge the problems addressed by the present invention. As such, one of skill in the art, faced with the problem of

providing a means for detecting the free edge of a body of rolled adhesive tape, would not look to the teaching of the '194 patent; and even if such was done, that party would not find any guidance therein which would lead to the principles of the present invention. Accordingly, the claims now at issue all define an invention which is patentable over the teaching of the prior art.

Conclusion

By the present amendment, Applicant has cancelled all pending claims and substituted therefor a new set of claims directed to one very specific embodiment of the present invention. In addition, Applicant has presented a detailed analysis of the prior art, as it relates to the present invention; and this analysis makes very clear that these new claims are all patentable over the prior art.

The application is in condition for allowance, and expeditious notice thereof is earnestly solicited. Any questions, comments or suggestions which the Examiner may have, which will place the application in better condition for allowance, should be directed to the undersigned attorney.

Respectfully submitted,

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